Moving from Evaluation to Trial: How do SMEs Start Adopting Cloud ERP?

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Abstract

The advent of cloud technology involving low subscription overheads cost has provided small and medium-sized enterprises (SMEs) with the opportunity to adopt new cloud-based corporate-wide systems (i.e., cloud ERP). This technology, operating through subscription-based services, has now provided SMEs with a complete range of IT applications that were once restricted to large organisations. As anecdotal evidences suggest, SMEs are increasingly adopting cloud-based ERP software. The selection of an ERP is a complex process involving multiple stages and stakeholders, suggesting the importance of closer examination of cloud ERP adoption in SMEs. Yet, prior studies have predominantly treated technology adoption as a single activity and largely ignored the issue of ERP adoption in SMEs. Understanding of the process nature of the adoption and the factors that are important in each stage of the adoption potentially may result in guiding SMEs to make well-informed decisions throughout the ERP selection process. Thus, our study proposes that the adoption of cloud ERP should be examined as a multi-stage process. Using the theory of planned behaviour (TPB) and Ettlie's adoption stages, as well as employing data gathered from 162 owners of SMEs, our findings show that the factors that influence the intention to adopt cloud ERP vary significantly across adoptive stages.

Keywords: SME decision-makers; cloud ERP; TPB; multi-stage

1 Introduction

The employment of corporate-wide systems, such as enterprise resource planning (ERP) systems, appears to be the most significant development in business use (Sedera and Gable 2010) and has been discussed heavily within information systems (IS) research since it was first developed in the 1990s (Klaus et al. 2000). Interestingly, IS researchers have predominantly looked at the adoption of ERP by large organisations (e.g., Soh et al. 2000, Sykes et al. 2014) with much less attention being paid to small and medium-sized enterprise (SME) adoption (Eden et al. 2014).

The advent of software-as-a-service (SaaS) models through cloud technology (Sharma and Sood 2011) has given SMEs the opportunity to embrace corporate-wide systems (Sedera et al. 2014, Walther et al. 2015). Such engagement of technology through subscription–based technology access and minimal infrastructure has given SMEs a complete range of IT applications that were once restricted to their larger counterparts. A recent survey by Gartner group on the future of corporate-wide system adoption found that 47% of the firms planned to move to cloud-based systems within the next five years and the majority of those were SMEs (Rayner 2014). According to Fox et al. (2009), the increase in adoption rates among SMEs can

be attributed to the benefits of deploying ERP systems through cloud technology (i.e., cloud ERP) that have enabled lower subscription costs (Forrest and Barthold 2009) while maintaining the same functionality as on-premise ERP systems (Koslowski and Strüker 2011). Further, given the typical setting of an SME that does not have an IT department, the benefit of consulting services provided by the cloud service provider could be obtained.

For the purposes of this study, the definition of cloud ERP is derived through an amalgam of the National Institute of Standards and Technology (NIST) (2011) conceptualisation of cloud computing and Markus et al.'s (2003) definition of ERP. Herein, cloud ERP is defined as *commercial software packages that enable the integration of business processes and transaction-oriented data throughout the organisation using a model that enables ubiquitous, convenient, on-demand network access within minimal management effort or service provider reaction*.

Parallel with the increasing number of cloud ERP adoptions among SMEs, there has been a growing recognition of the importance of revealing technology adoption as a process. A number of scholars have presented their studies through a process concept (e.g., Campbell et al. 2013, Choudhury and Karahanna 2008, Karahanna et al. 1999, Pavlou and Fygenson 2006) by demonstrating that the factors influencing technology adoption fluctuate as the adoption process progresses. However, the focus of existing studies of technology adoption have mainly been limited to the following aspects, namely: (i) simple technology adoption (e.g., website adoption and transactional information systems); and (ii) technology adoption within a single broad stage (e.g., pre-adoption, adoption and post-adoption). As Damanpour and Schneider (2006) alluded, the current approaches of technology adoption studies are neither able to explain the complex nature of corporate-wide systems adoption nor differentiate the changes in the importance level of each factor in different stages of the adoption process. Although there are a few studies (e.g., Del Aguila-Obra and Padilla-Melendez 2006, Dholakia and Kshetri 2004) that have looked on organisational technology adoption, these studies are now dated and focus on simple technology rather than complex systems such as cloud ERP.

The criticality of clear comprehension of the factors that influence corporate-wide systems adoption (i.e., pre-use) for IS research is highlighted by a number of reasons including: (i) the possibility of making the wrong decision during the adoption process (Winters et al. 2008); (ii) the inability to observe the change in critical adoption factors during the adoption process (Law and Ngai 2007, Salim 2013); (iii) the inability to achieve adequate vendor involvement during the adoption process (Willcocks and Sykes 2000); (iv) the possibility for the firm to switch to an alternative technology from another vendor when not receiving adequate information during the early stage of the adoption process (Dubey and Wagle 2007); and (v) from the vendor's side, the inability to understand the reasons why some firms choose to drop out of the adoption process (Muscatello et al. 2003). However, studies investigating the comprehensive view of corporate-wide system adoption are still scant. Table 1 (Appendix A) shows the studies that specifically investigate corporate-wide system adoption in organisations, with most of the studies focusing on large firms and a single stage view of adoption factors (see Columns B and C). Motivated by the paucity of research explaining corporate-wide system adoption as a process view and the increasing number of SMEs abandoning the adoption half way through, this study investigates the factors that are critical across the adoption process in the context of SMEs.

While there is no conceptual framework resulting from this research, one of the contributions of this paper is to combine two complementary theories. First, the critical adoption factors are identified through the lens of the theory of planned behaviour (TPB) (Ajzen 1991) and the changes in the level of importance of adoption factors are observed through Ettlie's (1980) multi-stage adoption model. From the five stages that Ettlie (1980) has introduced, only two stages, namely, the "evaluation" and "trial" were selected to be investigated further in this study.The selection of the evaluation and trial stages was based on the following reasons: (i) the evaluation and trial stages are the most critical in the process of adoption (Howard and Sheth 1969); (ii) empirical studies have concluded that a large number of firms drop out of the adoption process as a result of receiving limited information on the system to be adopted (e.g.,

Arthur 1989, Au and Kauffman 2003); (iii) the evaluation and trial stages have apparent differences (i.e., before and after experiencing the use of cloud ERP), which enables fluctuations in the significance of the adoption factors to be observed in two different conditions; and (iv) completion of the evaluation and trial stages will lead SMEs to the final adoption stages (i.e., prior to use) where they are expected to decide to either go ahead or drop out of the process. This leads to the main research question posed in the present study: *What are the factors that influence SMEs to adopt cloud ERP during the evaluation and trial stages?* The study applied TPB (i.e., individual-level theory) as the adoption decisions in SMEs are made by a single person (i.e., the owner) who represents the firm's voice wholly. Thus, the unit of analysis of the present study is the individual level of adoption.

This study helps to understand corporate technology adoption of SMEs through three specific theoretical contributions. First, it provides a better understanding of how SMEs adopt cloud ERP by evidencing that each of the factors in each of the adoption stages has a different level of significance. Second, it presents the justification as to why certain factors are either superior or inferior in certain adoption stages. Third, the study demonstrates the use of a new theoretical lens of viewing cloud ERP adoption as a multi-stage process, rather than focusing on a single phase.

This paper proceeds as follows. First, the prior research that discusses adoption stages in several contexts, including corporate-wide systems (e.g., Verville and Halingten 2003), is outlined. Second, the methodology used for developing the study hypotheses is presented. Third, the analytical methods used to validate the scales and test the research model are presented, followed by the results of the study. The paper concludes with a discussion of the theoretical and practical implications and the limitations of the study, together with a discussion of future research directions and conclusions reached.

2 Theoretical Development

2.1 Studies related to technology adoption

Although there is a substantial body of research on technology adoption, in-depth discussion on technology adoption as a process is still limited. Presenting technology adoption as a process commenced in the 1960s when Rogers (1995) introduced a model comprising five adoption stages. Later, Zaltman et al. (1973) reviewed and updated Rogers' model making it more consistent. The updated model then appeared in a few technology adoption studies (e.g., Ettlie 1980, Fichman and Kemerer 1997, Salim et al. 2014). As discussed in Fichman and Kemerer (2012), the term "technology adoption" explains a broader spectrum of activities starting from awareness of the technology through to the widespread deployment of the technology in the organisation.This view is in line with the broader stages of technology adoption, including pre-adoption, adoption and post-adoption, that have been discussed in prior literature (e.g., Aguirre-Urreta and Marakas 2012, Schwarz et al. 2014). Conversely, some studies refer to these stages as initiation, adoption decision and implementation, respectively (e.g., Pierce and Delbecq 1977, Rogers 1995, Zmud 1982). However, this study restricts its focus to the adoption stages that happen within the adoption process (which falls in the "prior-to-use" period). These include: initial awareness of the existence of the technology, interest in the benefits of the technology, evaluation of the technology, trial of the technology and, finally, commitment to adopt. This study uses the definition of adoption as proposed by Frambach and Schillewaert (2002). In this particular definition, adoption refers to the sequence of stages through which an innovation (i.e., new technology) passes before the new product, service or idea will be accepted by a potential adopter prior to being used. Further, in this study, the terms adoption and adoption process will be used interchangeably to refer to the definition proposed by Frambach and Schillewaert (2002). Similarly, adoption stages refer to the sequence of stages that happen within the adoption process.

There are several studies which have discussed the stages of adoption (e.g., Ettlie 1980, Guo and Barnes 2011, Verville and Halingten 2003) where the number of stages range from five (e.g., Shoham 1992) to seven (e.g., Mintzberg et al. 1976). Most studies agree on five common

stages spanning the technology adoption process, specifically: (1) awareness / need identification / knowledge, (2) interest / information search / product brokering, (3) evaluation / selection / negotiation, (4) trial / choice / decision, and (5) commitment / purchase / implementation / adoption. More concisely, they have discussed the following stages: awareness → interest → evaluation → trial → commitment, where these represent the full adoption process. For the purposes of this study, the five adoption stages, namely, awareness, interest, evaluation, trial and commitment, in the model proposed by Ettlie (1980) are the best choice due to the following reasons: (i) it provides a detailed breakdown of the decision-making process yet it is not exhaustive; and (ii) it matches the industry roadmap of technology adoption stages (e.g., SAP value). Fichman and Kemerer (1997) have made two changes to Ettlie's (1980) technology adoption stages model. First, Ettlie's sixth stage was not included in the new model because the present study focuses on the stages before the decision is made (adoption). Second, the fifth stage of Ettlie's technology adoption stage has been changed from adoption to commitment .The new term can be deemed as more appropriate to fit the definition that Ettlie provides. Accordingly, this study follows the stages used in Fichman and Kemerer (1997). The details of Ettlie's adoption stages are described as follows.

2.1.1 Awareness

Awareness corresponds to the first adoption stage and commences when one or more individuals in an organisation identify an important problem and seek a solution (Rogers 1995). In many situations, problems can be solved by finding a suitable technology. The state of being aware could also happen fortuitously, that is, without realising either the problem and/or the need. For SMEs, the stage of being aware could come about from a diversity of sources including exposure to network peers, business partners and government regulations. Thus, it is suggested that being aware (at the awareness stage) can occur due to the influence of external factors (Rogers 1995). According to Ettlie (1980), awareness is the stage at which the organisation might be aware of the existence of the potential technology to be adopted in the market, however, the relevant information has not yet been obtained. Being aware will then lead to the next stage of adoption which comprises searching for and finding information.

2.1.2 Interest

In the second stage of adoption, individuals within the organisation start to gather as much information as possible on the particular technology which is the subject of interest (Ettlie 1980). Ettlie (1980) defined this stage as interest, whilst Engel et al. (1978), together with Verville and Halingten (2003), referred to it as search and information search, respectively. At this stage, the firm's representative (who in this context is the decision-maker) will start to, specifically; familiarise himself/herself with the technology (De Bruyn and Lilien 2008), pay attention to the advertisements (Butler and Peppard 1998), and eventually find the most appropriate vendor of the technology (Gopalakrishna and Lilien 1995).

2.1.3 Evaluation

Once all the information has been gathered, the relative advantages and disadvantages (Ettlie 1980) of cloud ERP will be compared. Ettlie (1980) referred to the action of comparing and contrasting as evaluation. Engel et al. (1978) labelled evaluation as an alternative evaluation purchase, while Guttman et al. (1998) branded it merchant brokering. Further, Robinson et al. (1967) divided evaluation into two sub-stages, namely, the acquisition and analysis of proposals, followed by the evaluation of proposals and selection of suppliers. According to Ettlie's study, evaluation signifies that "the new technology is being compared with the existing or future situation as to its relative advantages and disadvantages" (Ettlie 1980, p. 992). According to Verville and Alannah (2003), three distinct areas need to be evaluated when considering a purchase of corporate-wide software systems. These include the vendor and any functional and technical issues.

2.1.4 Trial

Trial denotes the stage where the firm has a chance to use the technology on a limited basis in order to determine its utility in a full-scale implementation (Ettlie 1980). The term 'trial' is

specifically referred to in Ettlie's (1980) research as being the "adequacy of stage models for decisions on adoption of innovation". A similar term is also used by Shoham (1992). For this stage, this study employs Ettlie's definition that "the new technology is presently being used on a limited basis in order to determine its utility in a full-scale implementation" (Ettlie 1980, p.992). With a cloud ERP package, adopters (firms) are offered free trial services of the product. With this free service, the adopters are then able to use the technology and understand how the system would integrate into the firm's business process. Hence, it would be easier to make a decision regarding the choice of the most suitable module for the firm (Budrienė and Zalieckaitė 2012). By having this opportunity, the adopters can experience the actual consequences of the system and thus, in turn, change the prevailing behavioural beliefs of the organisation. In fact, in most cases, firms will not adopt new technology without first trialling it on a probationary basis in order to determine its usefulness in their own situation (Rogers 1995, p.172). This kind of opportunity could also assist in reducing any perceived uncertainty in the firm concerning the new technology (Rogers 1995).

2.1.5 Commitment

According to Dwyer et al. (1987, p.19), commitment is "an implicit or explicit pledge of relational continuity between exchange partners" (e.g., firm and vendor). During this stage, both parties will have achieved a certain level of satisfaction (Dwyer et al. 1987) from the previous steps of the adoption process. In this stage, the experience and input gathered from the trial stage are considered in order to determine whether or not the technology will be adopted on a sustained and full-use basis (Ettlie 1980). From these five stages, only evaluation and trial were selected for this research discussion. Both stages are recognised as being the focus of new adopters (i.e., SMEs) as many activities that lead to acceptance happen in these two stages (Aguirre-Urreta and Marakas 2012). Further, as pointed out by Howard and Sheth (1969), evaluation and trial are recognised as being the most critical stages in the decision-making process, thus making these the most important periods for the firm to be able to move to the next level of adoption (i.e., acceptance stage). The selection of both stages is further supported by the fact that there is the possibility a firm will not purchase the technology after passing through the evaluation or trial stages. This is generally due to not receiving satisfactory follow-up actions from the consultant or vendor (Cisco 2012). Therefore, investigating the evaluation and trial stages would assist vendors to understand the factors that are important for firms to be able to proceed to the next stage and commit to the adoption of cloud ERP. From the firm's side, it promotes a perception of being able to reduce the possibility of making an incorrect decision when evaluating cloud ERP systems. In this study, the respondents are from SMEs where, in most cases (as per our survey sample), the owner is the person who makes the final decision as to whether or not the technology will be adopted. SMEs were selected as the subject of investigation since the characteristics of this firm are less complex compared to large organisations. Thus, the movement through the adoption stages is much quicker and the ability to produce evidence of the adoption progresses occurs over a shorter time period. Cloud ERP was selected as it provides the most suitable and affordable corporate-wide system for SMEs while maintaining almost all the functionalities of on-premise ERP systems.

During the process of understanding the nature of the adoption factors (henceforth referred to as "determinants") and demonstrating how the adoption decision happens, a few of the behavioural theories regarding adoption have been reviewed. Fishbein and Ajzen's (1975) theory of reasoned action and Ajzen's (1991) TPB are well-researched behavioural intention (henceforth called "intention") models that integrate grounded concepts and principles (Harrison et al. 1997). Both theories have successfully been used in predicting important behavioural patterns in several research domains. As TPB is an extended version of the theory of reasoned action, additional variables are included in TPB. In contrast to other theories that have been used in technology adoption (Burda and Teuteberg 2013) such as the technology acceptance model [TAM] proposed by Davis (1989) and the unified theory of acceptance and use of technology proposed by Venkatesh et al. (2003), TPB covers a range of other determinants. These are related equally to individual factors (e.g., owner's attitude) as well as other factors that are beyond the control of the individual, including social influences (i.e.,

subjective norms) and the facilitating conditions (i.e., perceived behavioural control). Given the flexibility of TPB determinants to account for conditions over which individuals do not have complete control (Taylor and Todd 1995), this theoretical lens was selected in the present study to predict SME owners' decisions concerning the adoption of the cloud ERP systems. Although SMEs and cloud ERP are the subject of interest, the adoption decision stages discussed in this paper do not differ from the stages experienced in large organisations. However, given that this study applies TPB as the theoretical lens in which the unit of analysis is at the individual level, it would be difficult to see how the adoption decisions are operationalised for large organisations. For large organisations, the important decision-making is typically distributed among the management team and not by a single person as in the SME.

2.2 Determinants of behavioural decisions through the lens of TPB

The conceptual model proposed in this study (as shown in Figure 1) is based on TPB, which has been employed in several research contexts to provide understanding and prediction of an individual's intention to adopt new technology (Ajzen 2011). Further, TPB suggests that an individual's intention to perform various kinds of behaviours can be predicted by: (1) the high precision of attitudes towards the behaviour; (2) subjective norms; and (3) perceived behavioural control (Ajzen 1985, Ajzen 1991, Phang et al. 2006, Sawang et al. 2014).

The theory also suggests that behaviour can be explained by the following: behavioural belief; normative belief and control belief as the antecedents of attitudes, subjective norms and perceived behavioural control respectively (Ajzen 1991, Bulgurcu et al. 2010). However, the large majority of the existing literature in the technology adoption field has focused on three determinants (namely, attitude, subjective norms, and perceived behavioural control) rather than including the three antecedents of the determinants.

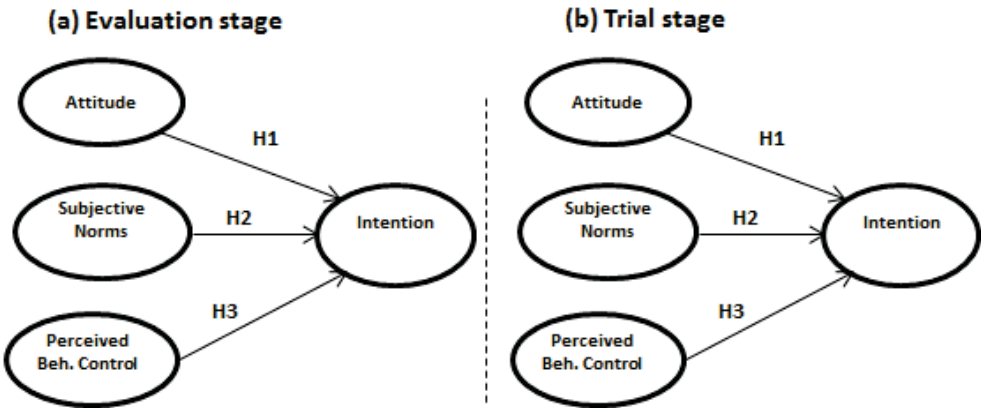

Figure 1: Conceptual model of cloud ERP adoption

The literature provides a rich understanding of the manner in which the aforementioned determinants can lead to intention and adoption in SMEs. Harrison et al. (1997) depicted how these three determinants work and also explored the process resulting from the decision of 162 small businesses from a broad range of industries to adopt IT. Using a structured survey, Harrison et al. found strong support for the theory that the process of adoption is influenced by the following determinants: attitude (e.g., perceived positive and negative attitudes), subjective norms (e.g., social expectations), and perceived behavioural control (e.g., resources to overcome obstacles). Pavlou and Fygenson (2006) employed TPB to predict the process of e-commerce adoption at the individual level. They also extended the capabilities of TPB in an attempt to predict two prevalent online behaviours, namely, acquiring information and purchasing products from web vendors. By looking at these two exemplars from the literature, it can be seen that TPB could possibly be extended to SMEs and multi-stage contexts.

Generally, the adoption of a new technology system involves a series of cognitive activities (attitude) within the individual's mind. Further, when making a decision, the individual may be influenced by issues related to social pressure (Nuwangi et al. 2013a) such as competitors, government compliance, customers, vendors, or employees (subjective norms). In addition, individual conditions such as perceived ease or difficulty (perceived behavioural control) help to facilitate the adoption of new technology (e.g., Alarifi and Sedera 2014, Bulgurcu et al. 2010, Grandon and Pearson 2004). Thus, this study employs these core concepts as the underlying theory, as explained by TPB. Therefore, these three determinants (attitude, subjective norms and perceived behavioural control) rooted in TPB are relevant to a wide variety of complex and subjective factors associated with cloud ERP adoption. In addition to examining the adoption determinants, these determinants are also polarised into the two most critical stages in the adoption process, namely, the evaluation and trial. This enables the fluctuation of the significance of the determinants in two different stages to be observed.

There are a large number of studies in technology adoption including: ERP adoption (e.g., Law and Ngai 2007, Ng and Gable 2010), individual technology adoption (e.g., Hernández et al. 2010, Pavlou and Fygenson 2006) and SME adoption (e.g., Grandon and Pearson 2004, Li et al. 2011, Meyer 2011, Quaddus and Hofmeyer 2007, Riemenschneider et al. 2003). However, none of those studies appear to discuss corporate-wide system adoption in a multi-stage view. This led to the building of five hypotheses as discussed next.

3 Hypotheses Development

This section explains the motivation behind SME owners' intention toward the adoption of cloud ERP. Applying the relationship of TPB constructs to the context of this research, it is posited that the SME owners' intention to adopt cloud ERP is determined by the attitude of the owner him/herself (Li et al. 2011). In this study, the *attitude* towards the intention to adopt cloud ERP is conceptualised as the "individual's overall positive or negative evaluation of the behaviour" (Ajzen 2011). Attitude is considered as one of the most significant predictors of behaviour (Kraus 1995). In addition, the majority of prior research confirms a positive effect of attitude on intention towards various contexts. A number of adoption studies have demonstrated that positive attitudes are more likely to lead to the adoption of technology (e.g., Childers et al. 2002, Curran and Meuter 2005, Thong and Yap 1995). Accordingly, this study posits that a favourable attitude towards cloud ERP is expected to cultivate an intention of adoption. Based on the above arguments, it is hypothesised that:

H1: The SME owner's positive (negative) attitude towards the adoption of new cloud ERP positively (negatively) affects his/her intention to adopt the system.

Subjective norms reflect an individual's intention to adopt through the referent of others' actions or thoughts (Burda and Teuteberg 2013, Pavlou and Fygenson 2006). Thus, it is suggested that when technology is relatively new, the owner of the SME may have insufficient knowledge (Nuwangi et al. 2012) or information by which to form his/her feelings towards the new technology. Therefore, behavioural intention can be influenced greatly by the opinions expressed by others (Alarifi and Sedera 2013, Thompson et al. 1994). *Subjective norms* can be described as the degree to which an individual perceives the opinion of others that he/she should adopt the technology (Venkatesh et al. 2003). In the context of SMEs where the owner makes the majority of the critical decisions, a strong influence could arise from external pressures such as large customers, network peers, vendors or government (Quaddus and Hofmeyer 2007). Pressure could also come from inside the organisation itself, for example, from the needs of employees and the firm. Based on the above arguments, it is hypothesised that:

H2: The subjective norms that support (discourage) cloud ERP adoption positively (negatively) affect the SME owner's intention to adopt the system.

Further drawing on the attributes of TPB, it is expected that the intention to adopt cloud ERP is determined by the level of *perceived behavioural control.* In this study, perceived

behavioural control is described as a person's intention to adopt new technology based on the extent to which the person believes that he or she has control over personal or external factors that may facilitate or restrain the behavioural performance (Ajzen 1991). Perceived behavioural control could also be explained as indicating a person's perception as to the respective ease or difficulty of the technology proposed to be adopted (Ajzen 1991, Riemenschneider et al. 2003). Prior studies have verified that the ability to provide adequate resources can facilitate the adoption of new technology. For example, perceived behavioural control (defined as the level of controllability and self efficacy) was the second most salient predictor (after attitude) of e-commerce adoption among internet users (Pavlou and Fygenson 2006). The characteristics of SMEs (e.g., smaller size, less complexity) could make the implementation of cloud ERP less complex, thereby encouraging the owner to continue with their intention to adopt the system. Based on the above arguments, it is hypothesised that:

H3: The SME owner's perceived behavioural control over the adoption of cloud ERP positively (negatively) influences the SME owner's intentions towards cloud ERP adoption.

3.1 Extending and polarising TPB determinants into evaluation and trial stages

Past studies into technology adoption have rarely attempted to provide an understanding of how the relationships between TPB constructs fluctuate at different stages of the adoption process. It appears that only Pavlou and Fygenson (2006) have applied TPB to study behavioural intention in two distinct stages. Their focus, however, was restricted to a single determinant (i.e., perceived behavioural control) with less discussion on the other two determinants (i.e., attitude and subjective norms). Limiting the discussion prevents a holistic understanding of how TPB determinants behave differently in different stages of the adoption process. This gap led the present study to investigate TPB determinants in two distinct stages (i.e., evaluation and trial).

The justifications for investigating TPB in different stages are based on the following scenarios. First, during the evaluation stage, owners form perceptions as to the benefits of the technology that they are planning to adopt (Ettlie 1980). These perceptions are formed through different perspectives; however, according to TPB and the adoption context of SMEs, the perception is typically formed through the opinion or pressure (Grandon and Pearson 2004) given by the stakeholders (e.g., vendors, clients or government). Using this scenario as an example, social influence (i.e., subjective norms) provides a greater impact on the intention of adoption as compared to other determinants. Meanwhile, in the trial stage, the owner is given the opportunity to use the system for a limited period. By doing this, the owner will receive a hands-on experience and hence gain a better sense of the technology that is going to be adopted. Having the experience and better sense will then lead to the attitude (i.e., perception and belief developed as a result of experiencing use of the system) being critical for the adoption, particularly in this stage (i.e., trial). The model tested in both the evaluation and trial stages yields hypotheses four and five as follows:

H4: The subjective norms of the SME owner relating to the adoption of cloud ERP are more significant than attitude and perceived behavioural control in the evaluation stage of the adoption.

H5: The SME owner's attitude towards adoption of cloud ERP is more significant than subjective norms and perceived behavioural control in the trial stage of the adoption.

4 Methodology

4.1 Instrument development

In developing measures, this study followed the guidelines stipulated by Churchill (1979) and MacKenzie et al. (2011). Herein, the study aimed to develop a good formative index that completely exhausts the entire domain of the construct. As such, the study attempted to

develop the constructs that collectively represent all the relevant aspects of the variable of interest (Bagozzi and Fornell 1982, Bagozzi and Phillips 1982, Fornell and Bookstein 1982). This exercise is well-supported by the wealth of literature on technology adoption which allows a detailed account of past studies to be brought into the current study. The existing measures were first adapted to the context of this study. The standard scale development procedures stipulated in Mackenzie et al. (2011) were then followed for new measures and those that required significant changes. This study operationalises normative belief, subjective norms and control belief as formative. The identification of normative belief, subjective norms and control belief as formative is ensured by adhering to the guidelines for identifying formative variables proposed by Jarvis et al. (2003). As per the guidelines for identifying formative variables, the constructs of subjective norms, normative beliefs and control beliefs: (i) need not covary; (ii) are not interchangeable; (iii) cause the core-construct as opposed to being caused by it; and (iv) may have different antecedents and consequences in potentially quite different nomological nets (Cenfetelli and Bassellier 2009, Jarvis et al. 2003, Petter et al. 2007). Moreover, the use of formative constructs in this case provides the specific and actionable attributes of a concept (Mathieson et al. 2001).This is particularly interesting from a practical viewpoint as the weight of the construct can be used to draw practical implications on the importance of specific details. It can therefore guide practical enforcement on the characteristics (see details in Furneaux and Wade 2011). It is noted that the formative conceptualisation contradicts past TPB studies, where the measurements are implied as reflective. However, given the aforementioned characteristics, this study argues that TPB constructs and measures may be considered as formative. Gable and Sedera (2009), who explored the extent of problems in the potential mis-specification of past IS research, highlighted that most formative indexes were mis-specified as being reflective in past IS studies.

Once the instruments were ready, the individual items for reliability and validity were assessed with a sample comprising 30 respondents. As soon as sufficient confidence was gained through this exercise, the study then proceeded with the full-scale survey administration. The measurement items (refer to Appendices B and C) were drawn from the literature and then adapted using standard psychometric instrument development procedures (Boudreau et al. 2001). The survey instruments were adapted from three different sources. For validating questions related to technology adoption determinants, findings from a study by Harrison et al. (1997) were adapted. Seven-point Likert scales, ranging from “strongly disagree” to “strongly agree”, were used for these types of questions. The instruments suggested by Harrison et al. (1997) were selected since the group of respondents that they investigated was similar to the present study’s respondents (i.e., owners of SMEs), in that they were using the same theoretical lens (i.e., TPB) and focusing on the same firm size. Studies by Ettlie (1980) and Fichman and Kemerer (1997) were personalised in order to develop questions pertaining to technology adoption stages. For this particular question, respondents were asked to tick the relevant option indicating the stage at which their firm was currently positioned in relation to cloud ERP adoption (each stage has an appropriate definition). The answers provided through this question enabled the total sample to be divided into different stages. The recommendations by Fichman and Kemerer were followed as their study operationalised and empirically validated the adoption stages. Ettlie’s (1980) study is nevertheless among the earlier founding works on the adoption stages and has also been adapted by Fichman and Kemerer. Thus, throughout this discussion, the original adoption stages from Ettlie are cited. The final instrument comprises six components, namely: intention, attitude, subjective norms, normative belief, control belief, and perceived behavioural controls.

4.2 Data collection and sample

A sample of SMEs was selected in a Southeast Asian country (Malaysia) for the data collection. Since there is no generally-accepted definition for SMEs, this study adopts the Malaysia National SME Development Council definition based on the following criteria: (i) sales turnover not exceeding RM50 million or full-time employees not exceeding 200 workers for the manufacturing sector, and (ii) sales turnover not exceeding RM20 million or full-time

employees not exceeding 75 workers for services and other sectors.The structures of SMEs are generally centralised, with the owner making most of the critical decisions. Also, the same owner tends to regularly make decisions at divergent levels (Salles 2006). In most cases, the same individual who makes the adoption decision will be the primary user of the technology to be adopted; hence, individual- and firm-level decisions are related (Li et al. 2011). To ensure that individual respondents reported accurately on behalf of their organisation, the key informant approach was applied following the guidelines of Segars and Grover (1998). In this study, the key informants were the owners of the respective SMEs where their opinions represented the voice of the entire firm.

A paper-based survey was administered for the data collection. A total of 162 respondents (i.e., a response rate of more than 80 percent) drawn from SME decision-makers or owners participated in and answered the survey. The survey received a high response rate as the questionnaires were distributed and collected during an event at which the speaker was one of the study's research members. The event was a voluntary one initiated by an email sent out to a list of SMEs which had been made available by the Malaysian government. Further, the attendance was voluntary and no incentives were provided to attend the conference or to take part in the survey. Two hundred and ten (210) surveys were distributed to those key stakeholders representing each organisation. The industries represented in the sample were: electrical (36%), financial services (21%), design consultancy (16%), manufacturing (12%), construction (10%), automotive (2%) and others (4%). About 68% of the sample are from firms where the number of employees range from 20 to 40 and 32% of the sample are from firms whose number of employees extend between 40 to 130. From this results of this distribution, it can be seen that the sample are from small and medium-sized enterprises. The sample for this study does not include micro-organisations as the use of technology, especially cloud ERP, is much less prevalent in micro-companies. Further, it is beyond the research scope to differentiate the level of significance of each determinant between different sizes of firms.

4.3 Data analysis

The partial least square (PLS) technique of structural equation modelling in SmartPLS 2.0 (Ringle et al. 2005) software was used to evaluate the research model and the measurement properties of the constructs and individual items. PLS also allows a researcher to simultaneously test the psychometric properties of the scales used to measure the variables in a measurement model (Henseler et al. 2015), as well as the estimation of the structural model on the strength and direction of the relationships between the variables (Xu et al. 2011). This study used PLS as it supports a small sample size well (Chin et al. 2003, Hulland 1999), thereby providing parameter estimates for relatively low sample sizes. The recommended "rule of ten" with a minimum sample size of 10 times the maximum numbers of arrows pointing towards a construct was also met (Hair et al. 2011) in the analysis conducted in the present research. PLS is also well-suited for predictive applications due to its variance-based nature (Hair et al. 2011). Further, PLS was chosen to accommodate the presence of formative factors.

5 Results

To evaluate and report the PLS estimates, the recommendations by Hair et al. (2011) were followed in a two-step approach suggested by Chin (2010).

5.1 Reflective measurement model

The assessment of the measurement model included the estimation of the internal consistency, discriminant and convergent validity. The measurement instrument for reflective constructs demonstrated sufficient reliability with all the factor loadings above 0.70 which is over the proposed threshold level of 0.5 (Nunnally and Bernstein 1991). The average variance extracted (AVE) values of all the reflective latent constructs were above the recommended threshold level of 0.5 (Fornell and Larcker 1981), showing sufficient convergent validity. Further, the composite reliability for each reflective construct was calculated in order to examine the internal consistency of all constructs and all met the suggested tolerances of above 0.70

(Fornell and Larcker 1981). Discriminant validity of all latent constructs was given as the square root of each construct's AVE being greater than the latent–variable correlation between each construct and its comparing construct (Hair et al. 2011) (Table 2).

Latent Construct	1	2	3	4	5	6
1. Attitude	**0.815**					
2. Control Belief	0.2713	**0**				
3. Intention	0.4479	0.2792	**0.827**			
4. Normative Belief	0.1611	0.2358	0.2895	**0**		
5. Perceived Beh. Control	0.0889	0.1371	-0.0933	-0.075	**0.841**	
6. Subjective Norms	0.2666	0.3022	0.3994	0.3891	0.1239	**0**

Note: The diagonal (bold and colored) shows the construct's square root of AVE

Table 2: Test for discriminant validity

5.2 Formative measurement model

Differing from the original TPB, the research model proposed in the present study has a few formative constructs by which the measurement provides specific and actionable attributes of a concept (Mathieson et al. 2001). Following the guidelines of Diamantopoulos and Siguaw (2006) as well as Diamantopoulos and Winklhofer (2001), the first step was to check for multi-collinearity among the measures. Formative measurement models are essentially based on regression (the formative construct against its measures) (Gable et al. 2008). As a result, the stability of the coefficients of the measures can be influenced by the strength of the respective intercorrelations and sample size (Gable et al. 2008). The variance inflation factor result from the multi-collinearity test was below 3; this falls under the proposed threshold of below 5. At the same time, the result for the measurement instrument for the formative construct showed sufficient reliability of factor weights.

5.3 Testing the hypotheses

First, in order to guard against global type I error, the acceptable α-level (0.05) is adjusted by dividing with the number of tests (Shaffer 1995) (in this case, three) where the test statistic will be significant if the associated p-value is less than 0.017. Here, tests are referred to as three different datasets that have been tested, including: full dataset (162 respondents), evaluation dataset (47 respondents) and trial dataset (115 respondents). From the adjustment (i.e., Bonferroni correction), the results show that significance levels of all the three main determinants (attitude, subjective norms and perceived behavioural control) have met the $p>0.017$ on the full dataset, the result of which can be found in Appendix D. By achieving the recommended significance levels, it indicates that the cumulative result of the full dataset does not have any global type I error. This study has also tested H1 to H3 on the full dataset. The results showed a slight difference from the divided dataset but did not change the original result of the research. Details of the results can be found in Appendix D.

Further, as the study aimed to examine the manner in which SMEs adopt cloud ERP by observing the different significance and strength of the relationships of three determinants in the evaluation and trial stages, the structural model was analysed by using two different types of data with two different sample conditions. The sample conditions were: (1) respondents who were in the evaluation stage, and (2) respondents who were in the trial stage. Both data were analysed using the PLS methodology (Hair et al. 2011) using SmartPLS software (Ringle et al. 2005).

With the help of PLS, an examination was conducted of the standardised path coefficients, path significances and variance explained (R^2) to test the predictive power of the structural model, as well as the relationships between the determinants using the two types of samples. The results of all these tests are illustrated in Figure 2.

While the possibility of a moderating effect of the adoption stages on the relationship between the three determinants is acknowledged, the main focus in this discussion is centred solely on the variances in intention determinants towards cloud ERP adoption decision.

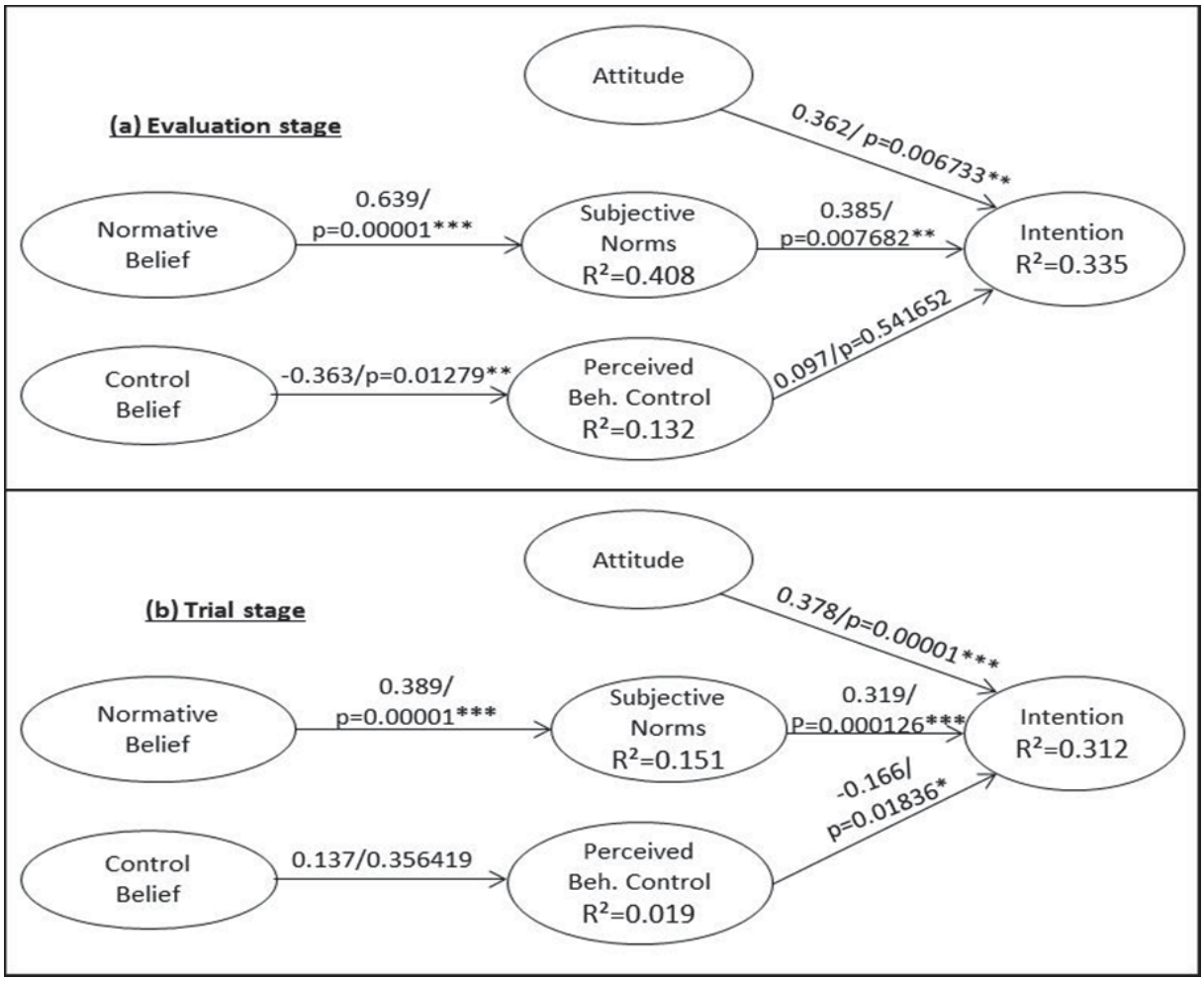

*Figure 2: Assessment of structural model for (a) evaluation and trial, and (b) stages of the adoption *p < 0.05; **p < 0.01; ***p < 0.001.*

5.3.1 Testing Hypothesis 1:

The first hypothesised relationship – *H1: The SME owner's positive (negative) attitude towards the adoption of new cloud ERP positively (negatively) affects the SME owner's intention to adopt the system* – is tested by reference to the structural model illustrated in Figures 2a and 2b. These structural models support the hypothesised relationship where the models concerning evaluation and trial (Figures 2a and 2b) also affirm significant positive relationships between attitude–intention (evaluation: β=0.362, p<0.001, trial: β=0.378, p<0.001), thereby lending support to the first hypothesis.

5.3.2 Testing Hypothesis 2:

The second hypothesised relationship – *H2: The subjective norms that support (discourage) cloud ERP adoption positively (negatively) affect the SME owner's intention to adopt the system* – is tested by reference to the structural models presented in Figures 2a and 2b. Both structural models showed a significant positive relationship between subjective norms and intention (i.e., evaluation stage: β=0.385, p<0.001, and trial stage: β=0.319, p<0.001), thereby lending support to the second hypothesised relationship.

5.3.3 Testing Hypothesis 3:

The third hypothesised relationship – *H3: The SME owner's perceived behavioural control over the adoption of cloud ERP positively (negatively) influences the SME owner's intention towards the adoption* – is tested by reference to the path coefficients and the significance of the relationship between perceived behavioural control and intention, as shown in Figures 2a and 2b. A positive relationship between perceived behavioural control and intention was predicted; however, the results show a negative relationship for the trial stage. Similarly, even though the relationship of perceived behavioural control in the evaluation stage is positive, the level of significance is very low (i.e., evaluation stage: β=0.097, $p<0.001$, and trial stage: β= -0.166, $p<0.001$) which challenges the relationship that was hypothesised.

5.3.4 Testing Hypotheses 4 and 5:

The fourth hypothesised relationship was tested by making reference to the two structural models illustrated in Figure 2. As shown in Figure 2a (i.e., evaluation stage), the path coefficient between subjective norms and intention shows a much more powerful and significant relationship compared to the other two predictor determinants (i.e., attitude and perceived behavioural control) (attitude–intention, β=0.362, $p<0.001$, subjective norms–intention β=0.385, $p<0.001$, and perceived control–intention β=0.097, $p<0.001$)). This comprises three predictor determinants, namely, attitudes, subjective norms and perceived behavioural control, explaining 33.5% of the variance in behavioural intention (R^2). Next, Figure 2b (i.e., trial stage) is referred to for the fifth hypothesised relationship. As can be seen therein, the attitude displays a much stronger relationship to intention than subjective norms and perceived behavioural control in the trial stage (attitude–intention, β=0.378, $p<0.001$, subjective norm–intention β=0.319, $p<0.001$, perceived control–intention β= - 0.166, $p<0.001$), with the three predictor determinants (attitudes, subjective norms and perceived behavioural control) explaining 31.2% of the variance in behavioural intention (R^2). Accordingly, the result of Hypotheses 4 and 5 suggests that the level of significance of attitude, subjective norms and perceived behavioural control for intention will vary as the condition of the adoption process changes (i.e., progressing from one stage to another), thereby lending support to the fourth and fifth hypothesised relationships.

6 Summary and Implications for Research

This study investigates how SMEs adopt the cloud ERP system using multiple theoretical lenses, namely, the TPB (Ajzen 1991) and technology adoption stages (Ettlie 1980). Using these theoretical lenses, the study examined the relationship between an SME owner's attitude, subjective norms and perceived behavioural control towards the intention to adopt cloud ERP in two distinct stages: the evaluation and trial. As hypothesised, attitude and subjective norms displayed a significant positive relationship towards the intention to adopt cloud ERP by SMEs. Despite predicting a positive relationship towards intention, the findings showed a negative relationship for perceived behavioural control. A possible reason for this discrepancy is the enormous pressure exerted on SMEs by the government and other regulatory bodies to implement cloud ERP (i.e., compliance), in the current context. As such, even though the SME owner may believe that the firm does not have sufficient capability and resources (Nuwangi et al. 2013b) to facilitate the adoption of cloud ERP, their intention to adopt is high due to the overriding influence of subjective norms.

Next, in line with the second research objective, the data were analysed for variances in intention determinants towards cloud ERP adoption. The findings showed that attitude, subjective norms and perceived behavioural control perform differently during the evaluation and trial stages (refer to Figures 2a and 2b). The relationship of subjective norms towards intention is greater in the evaluation stage than in the trial stage. This occurs as a result of the owner receiving pressure from an external source (e.g., vendors, clients or government). On the other hand, the results demonstrated that an owner's attitude can supersede subjective norms and perceived behavioural control in the trial stage. The use of a cloud ERP system

through a limited time period gives the owner an opportunity to become familiar with the system. Accordingly, this leads to a superiority of attitude in this stage.

6.1 Implications

This study makes theoretical contributions to the body of technology adoption research specifically in the domain of technology adoption by SMEs. There is no doubt that a considerable number of past studies have assumed that technology adoption is a single stage process. However, the decision to adopt new technology (especially in the case of corporate-wide systems) comprises several activities such as: searching for information, comparing, evaluating, trialling and, finally, committing. Treating corporate-wide system adoption as a snapshot can lead to erroneous adoption decisions (e.g., forcing firms to deal with unsuitable applications for a period of time). These issues call for the inclusion of multi-stages in technology adoption models. Viewing corporate-wide system adoption as a multi-stage process not only leads to a more complete understanding of owners' behaviour patterns, but could also improve the predictive power of complex technology adoption models. Accordingly, this study presents an intention model by which to explain and predict owners' behaviour patterns regarding cloud ERP adoption. As the trend towards cloud ERP adoption has been predicted to result in revenues of about $33 billion by 2016 (Anderson et al. 2013), understanding the important determinants that influence these key stakeholders (e.g., decision-makers) could assist vendors as well as consultants in prioritising their strategies regarding the provision of more detailed information.

Further, this paper extends the scope of TPB in four different ways. First, through this work, TPB is extended into the field of corporate-wide system adoption. Although Pavlou and Fygenson (2006) extended TPB by examining two different behaviours (i.e., stages), their work is still limited to individuals (consumers). In this study, the notions of TPB are used to gain inferences of the corporate-wide system adoption. Though the participation is at individual level, it allowed the researchers to make observations about corporate technology adoption. Second, the study succeeded in changing the normal perception of TPB. Earlier TPB studies have treated the adoption determinants as positive or significant. However, in the research context of the present study, the result showed that perceived behavioural control has a negative relationship towards intention. In other words, the level of significance for perceived behavioural control is very low as compared to the attitude and subjective norm determinants. Third, as this study modelled two distinct stages of technology adoption in parallel, the dependency of the evaluation and trial stages on the final stage (i.e., commitment) were observed. Providing two related stages (activities) to be concurrently modelled could open a new avenue of future research. Fourth, the present study shows theoretically and empirically that subjective norms, normative belief and control belief are formative constructs respectively. These findings are unusual in comparison to prior TPB studies which have mostly treated all TPB constructs as reflective. Although the majority of researchers assume that the measurement model is reflective, there are in fact many instances in which this assumption may not be theoretically or empirically justified.

From the practitioners' point of view, this study contributes to the industry by providing guidance to the ERP ecosystem (vendors, consultants and communities) in an attempt to understand their potential buyer's behaviour and perception toward the adoption of cloud ERP. It shows the role of external agencies (such as government or business partners) in triggering the continuity of cloud ERP adoption especially in the early stages of the process. However, the owner's attitude supersedes other determinants once the firm is using cloud ERP on a trial basis.

7 Limitations, Future Work and Conclusions

This research was not without some limitations. First, this research only examined the evaluation and trial stages in order to understand the corporate-wide systems adoption process. However, it is not possible to fully explain the entire corporate-wide systems adoption process without considering other stages of the adoption process. Therefore, it is proposed that

future researchers consider other stages in the adoption process, such as awareness, interest and commitment in order to more fully explain the process of corporate-wide systems adoption. Second, this study only used intention as the dependent variable, thus limiting the ability to predict how intention transforms into actual behaviour. Third, in reference to TPB, all the constructs in the proposed model reflect the assessment of cloud ERP adoption. Consequently, this prevents the generalisation of the findings to other types of complex technology adoption. Therefore, additional research that could capture a general construct pertaining to other types of corporate-wide systems could be undertaken in the future. Fourth, the use of TPB (individual adoption theory) for organisation technology adoption only applied for organisations where the important decision is made by an individual and his/her decision represents the voice of the entire firm. However, for organisations with multiple decision-makers, the result from the finding cannot be generalised. In conclusion, this study demonstrates that the predictors or determinants of cloud ERP adoption have different effects at different stages of the adoption process. By using TPB, in addition to Ettlie's (1980) stages, as the theoretical lens, the study has shown that these determinants (i.e., attitude, subjective norms and perceived behavioural control) possess and provide different levels of significance at different stages. Among all these determinants, subjective norms provide the most significant impact in the evaluation stage, while the owner's attitude towards technology provides the most significant impact in the trial stage. Additionally, this study complements existing technology adoption research (e.g., Harrison et al. 1997) by integrating two stages and testing them simultaneously. The context of the Malaysian study which provided data for this research may be perceived as a limitation. As mentioned earlier in the discussion, each country yields to a specific definition of what an SME might be. Further, governmental and industry / customer pressure are two variables that might be of interest for a future study.

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Appendices

Appendix A – Ten most cited studies on corporate-wide systems adoption

References (A)	Study Focus (B)	Findings (C)
Liang et al. (2007)	This study illustrates how top management can mediate the impact of external institutional pressures on the usage of enterprise systems assimilation within large organisations.	The study suggests that mimetic pressure and coercive pressures positively affect top management beliefs, which then positively affect top management participation in the ERP assimilation process. On the other hand, normative pressures directly affect ERP usage without requiring the participation of a mediator from among top management.
Wixom and Todd (2005)	This study develops an integrated research model that differentiates beliefs and attitudes about the system. It achieves this by examining beliefs and attitudes concerning the use of the systems through a sample of 465 users in seven large organisations.	Findings from the study supported the hypothesized model in that user satisfaction and technology acceptance can and should be integrated.
Amoako-Gyampah and Salam (2004)	This study presents an extension of the technology acceptance model (TAM) by empirical testing using a field survey from a large global organisation that was in the process of implementing an ERP system. Further, the study aims to examine how shared beliefs impact upon the core TAM variables in the context of ERP.	The study found that managerial interventions, such as training and communication, influence the acceptance of technology while perceived usefulness and ease of use contribute to the behavioural intention to use the technology.
Teo et al. (2003)	This study investigates institutional pressures that facilitate the adoption of financial electronic data interchange (FEDI) in an institutionalized environment. It provides feedback from 222 respondents ranging from CEOs to CFOs and CIOs.	The result shows the way in which mimetic, coercive and normative pressures had a significant influence upon the intention to adopt FEDI.
Venkatesh et al. (2003)	This study designed a unified technology acceptance model using longitudinal field studies data at four large organisations that were being introduced to this new technology in the workplace.	From the eight intention and usage models discussed in the study, it can be seen that performance expectancy, effort expectancy, social influence, and facilitating conditions provide very significant or direct effect determinants. Meanwhile, attitudes towards using technology, combined with self- efficacy and anxiety give less or no direct effect towards intention and usage.
Robey et al. (2002)	This study presents a comparative case study involving 13 large firms that implemented an enterprise resource planning (ERP) system by comparing their dialectic learning process.	The study found seven distinct motivations for pursuing ERP including: Y2K compliance, legacy system replacement, process re-engineering initiatives, integration of multiple sites, support growth, improved reporting and decision-making, as well as regulatory compliance.

Soh et al. (2000)	This study explains the unanticipated "misfits" of ERP adoption in the context of Asian countries which typically reflect a bias towards Western practices.	Few misfit types and solutions have been discussed as a way to anticipate the uniqueness of ERP adoption in an Asian context. Overall, there is a need for vendors to explain the embedded data requirements and processes of ERP to organisations.
Venkatesh and Davis (2000)	This study discusses an extension of the technology acceptance model (TAM) by measuring three different points in time in each organisation using longitudinal data collected from four different large organisations.	Social influence processes (subjective norms, voluntariness and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability and perceived ease of use) significantly influence user acceptance.
Dishaw and Strong (1999)	This study focuses on the theoretical foundation of the technology acceptance model (TAM) and the task-technology fit model (TTF) that can be integrated. The integration model was tested using data collected from programmers at three different organisations all using large management information systems.	The integrated path model shows an acceptable fit to the data with the amount of variance in the dependent variable explained by this model as being higher than the variance accounted for in either TAM or TTF alone.
Adams et al. (1992)	Using research by Davis (1989) as the basis of their discussion, this study focuses on evaluating psychometric properties of ease of use and usefulness. This is performed by examining the relationship of both constructs using survey data collected from 118 respondents from 10 different organisations using voice and electronic mail.	The study has proved that the extended setting of Davis (1989) is reliable and valid. Further, it indicates that usefulness is related to usage, but ease of use is relatively less important in determining overall use.

Table 1: Ten most-cited studies on corporate-wide systems adoption – references, focus of study and study findings.

Appendix B - Measurement instrument for evaluation stage

Reflective Measures		Outer Loadings	T-value	Composite Reliability	AVE
ID	Item				
Intention (Adapted from Harrison et al. 1997)				0.8422	0.641
IN1	Our company will definitely implement cloud ERP in the next 6-12 months	**0.8626**	**31.0762**		
IN2	Our company will certainly make an effort to implement cloud ERP in the next 6-12 months	**0.7448**	**9.653**		
IN3	Our company is planning to implement cloud ERP in the next 6-12 months	**0.7901**	**13.2862**		
Perceived Behavioral Control (Adapted from Harrison et a.l 1997)				**0.8786**	**0.8565**
PBC1	Overall, introducing cloud ERP would be easy for our firm	**0.9144**	**9.2614**		
PBC2	Overall, introducing cloud ERP would be under the firm's control	**0.9364**	**29.966**		
Attitude (Adapted from Harrison et al. 1997)				0.9227	0.5452
AT2	Overall, introducing cloud ERP would be positive for our firm	**0.8032**	**14.1149**		
AT3	Overall, introducing cloud ERP would be highly effective for our firm	**0.8469**	**18.6035**		
AT4	Overall, introducing cloud ERP would be wise for our firm	**0.5427**	**4.8837**		
AT5	Overall, introducing cloud ERP would reduce costs for our firm	**0.7238**	**9.1315**		

Formative Measures		Outer Weights	T-value
ID	Item		
Normative Belief (Adapted from Harrison et al. 1997)			
NB1	To what extent do you believe that customers/clients think you should introduce cloud ERP	**0.8688**	**11.5562**
NB2	To what extent do you believe that suppliers/vendors think vou should introduce cloud ERP	**0.3108**	**2.1882**
Subjective Norm (Adapted from Harrison et al. 1997)			
SN1	To what extent do you value the opinion of customers/clients in relation to introducing cloud ERP	**0.8858**	**10.0793**
SN2	To what extent do you value the opinion of suppliers/vendors in relation to introducing cloud ERP	**0.177**	**1.2792**
Control Belief (Adapted from Harrison et al. 1997)			
CB4	How likely is it that your firm has the resources to train your current employees in the use of cloud ERP in the next 6-12 months	**0.5278**	**2.3228**
CB5	How likely is it that your firm has the ability to obtain additional employees if needed to enable use of cloud ERP in the next 6-12 months	**0.5444**	**2.3044**

Appendix C - Measurement instrument for trial stage

Reflective Measures		Outer Loadings	T-value	Composite Reliability	AVE
ID	Item				
Intention (Adapted from Harrison et al. 1997)				0.8741	0.6987
IN1	Our company will definitely implement cloud ERP in the next 6-12 months	0.8743	23.9407		
IN2	Our company will certainly make an effort to implement cloud ERP in the next 6-12 months	0.8471	15.3936		
IN3	Our company is planning to implement cloud ERP in the next 6-12 months	0.7837	14.545		
Perceived Behavioral Control (Adapted from Harrison et al. 1997)				0.8926	0.7359
PBC1	Overall, introducing cloud ERP would be easy for our firm	0.9095	10.9146		
PBC2	Overall, introducing cloud ERP would be under the firm's control	0.8928	9.8551		
PBC3	Overall, introducing cloud ERP would be simple to arrange	0.7639	4.1509		
Attitude (Adapted from Harrison et al. 1997)				0.9253	0.7127
AT1	Overall, introducing cloud ERP would be helpful for our firm	0.8133	22.5512		
AT2	Overall, introducing cloud ERP would be positive for our firm	0.875	40.9754		
AT3	Overall, introducing cloud ERP would be highly effective for our firm	0.8343	21.0041		
AT4	Overall, introducing cloud ERP would be wise for our firm	0.8602	29.5451		
AT5	Overall, introducing cloud ERP would reduce costs for our firm	0.8369	21.9783		

Formative Measures		Outer Weights	T-value
ID	Item		
Normative Belief (Adapted from Harrison et al. 1997)			
NB2	To what extent do you believe that suppliers/vendors think you should introduce cloud ERP	0.5496	2.3652
NB3	To what extent do you believe that government thinks you should introduce cloud ERP by means of incentives/tax exemptions?	0.4715	1.7874
NB4	To what extent do you believe that technical staff think you should introduce cloud ERP	0.4582	1.4196
Subjective Norm (Adapted from Harrison et al. 1997)			
SN1	To what extent do you value the opinion of customers/clients in relation to introducing cloud ERP	0.165	0.6579
SN2	To what extent do you value the opinion of suppliers/vendors in relation to introducing cloud ERP	0.4106	1.6146
SN3	To what extent do you value the opinion of government through incentives/tax exemption in relation to introducing cloud ERP	0.3201	1.5126
SN4	To what extent do you value the opinion of technical staff in relation to introducing cloud ERP	0.2479	0.7651
SN5	To what extent do you value the opinion of employees in relation to introducing cloud ERP	0.3021	0.992
Control Belief (Adapted from Harrison et al. 1997)			
CB1	How likely is it that your firm has financial assets that could enable your firm to use cloud ERP in the next 6-12	0.3631	0.7417
CB2	How likely is it that your firm has time to use cloud ERP in the next 6-12 months	0.3281	0.7609
CB5	How likely is it that your firm has the ability to obtain additional employees if needed that could enable your firm to use cloud ERP in the next 6-12 months	0.7037	1.6054

Appendix D – full dataset result with 162 number of respondents